E-2 PIPE INLET PROTECTION

PURPOSE & APPLICATIONS

Pipe inlet protection is a protective armor for the immediate area around the inlet of a pipe or culvert to protect it from scour and deterioration. This standard applies to the inlets of underground conduits designed to dispose of excess surface and subsurface water, culverts, and to principal spillways in ponds.

CONSIDERATIONS

Durability, ease of maintenance, and availability of materials as well as aesthetics and safety should be considered when selecting the appropriate inlet protection measure.

SPECIFICATIONS

Design Criteria

All inlets to hydraulic conduits will be adequately protected from scour caused by the entrance velocity, turbulence, and suction of the water entering the inlet. Protective measures shall extend no less than one pipe diameter, or maximum dimension on rectangular conduits, on the sides, top, and approach channel. An inlet "pool" will be beneficial for fish habitat. One of the following options must be used to stabilize the inlet structure:

Vegetative Measures Vegetation shall be installed according to the standards of the PERMANENT VEGETATION BMP. All newly seeded areas must be mulched. Mulch must be anchored with netting or matting. Refer to the TEMPORARY MULCH BMP.

On gravel and clay embankments the slope must be flatter than 2:1 and the conduit must extend beyond the fill by at least 1/2 pipe diameter on both sides and top.

On sand and silt embankments the slope must be flatter than 2.5:1 and the conduit extend beyond the fill by at least one pipe diameter on both sides and top.

Riprap: Riprap shall be installed according to the RIPRAP SLOPE STABILIZATION BMP and the RIPRAP WATERWAYS BMP AND be of a size able to withstand the velocity of flow up to a maximum D50 of 12 inches.

Gabion mats shall be installed according to the GABION BMP.

Riprap protection or gabions must be underlain with a gravel filter or a geotextile to prevent piping through the backfill material.

Inlet Protection: Inlet works shall extend at least one pipe diameter beyond the conduit. Rigid inlet retaining wall types shall be reinforced to be able to withstand settling, frost heaving, and other associated loading without cracking or otherwise failing.

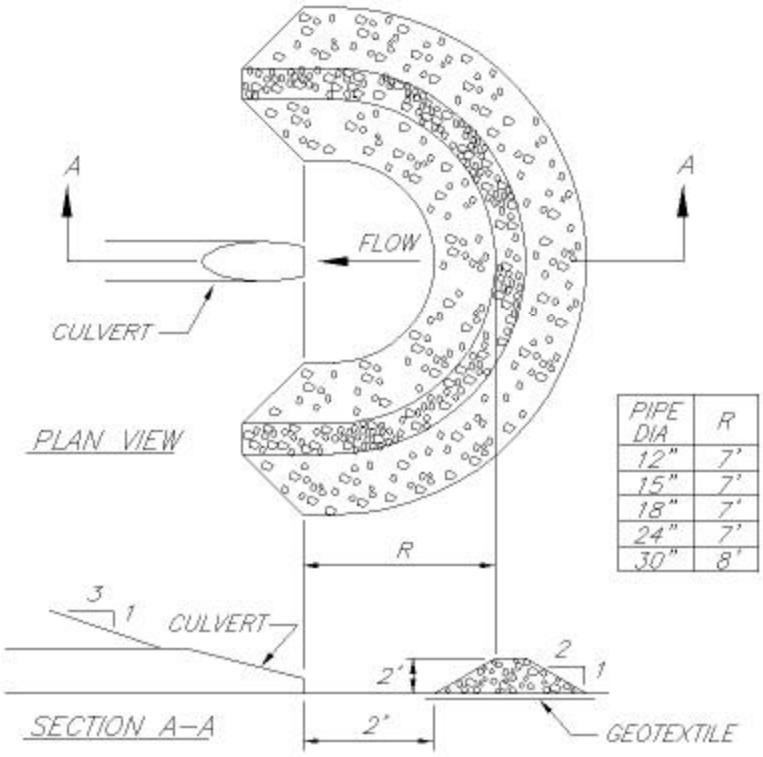
Structural non-rigid retaining walls built of various kinds of block shall have a camber inward of at least 1/2:1 and have protection from piping.

Construction Specifications

Refer to the RIPRAP, GABIONS and PERMANENT VEGETATION BMPs. Use industry standards for reinforced concrete structures or any other manufactured system.

MAINTENANCE

Refer to the appropriate BMPs to stabilize the inlet structure.



PIPE DIA	R
12"	7'
15"	7'
18"	7'
24"	7'
30"	8'

NOTES:

1. USE 2" TO 3" STONE.
2. PLACE STONE OVER GEOTEXTILE.
3. ONCE THE AREAS UPSTREAM FROM THE CHECK DAM ARE STABILIZED BY VEGETATION, THE SEDIMENT TRAPPED BEHIND/WITHIN THE DAM SHALL BE RELOCATED TO AN AREA UNDERGOING FINAL GRADING.
4. THE CHECK DAMS SHALL BE FLATTENED AND GRADED IN A MANNER WHICH PROTECTS THE AREA FROM EROSION AND CHANNEL BLOCKAGE. (GEOTEXTILE MUST BE REMOVED).
5. THE GEOTEXTILE SHALL BE DISPOSED OF OFFSITE.
6. THE AREA CONTRIBUTING TO THE CHECK DAM SHALL NOT EXCEED 10 ACRES.

TEMPORARY CHECK DAM AT CULVERT ENTRANCE

FILE: CHKDAMJULV